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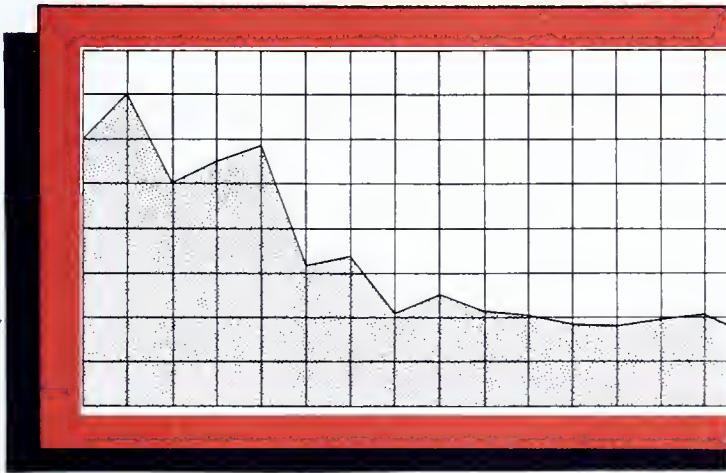
AUG 27 1968







# A STUDY OF ACCIDENTS To Pennsylvania Farm People



BULLETIN 398



DEPARTMENT OF PUBLIC INSTRUCTION

In cooperation with The Pennsylvania State University

Commonwealth of Pennsylvania

Harrisburg

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# A STUDY OF ACCIDENTS To Pennsylvania Farm People



BULLETIN 398

COMMONWEALTH OF PENNSYLVANIA  
DEPARTMENT OF PUBLIC INSTRUCTION

HARRISBURG

*In Cooperation With The Pennsylvania State University*



# Foreword

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TODAY life in the United States has become increasingly complex. Scientific and technological achievements have transformed our American way of life. Accordingly our schools are expanding their programs of services in such a way as to prepare our young people for living in a tremendously altered social order, with changes taking place with breath-taking rapidity.

The teaching of safety in all its aspects must now be considered in shaping the educational program in every American community. Such safety instruction is especially urgent in rural schools, for the hazards of living in agricultural areas far exceed those in urban communities.

This bulletin, *Accidents to Pennsylvania Farm People*, has been prepared as a contribution to safety education. Abundant illustrative tables and charts portray graphically the dangers encountered by people who live on farms.

This publication is based on a detailed study made in 1954-55 by the Department of Agricultural Economics and Rural Sociology of The Pennsylvania State University, with the cooperation of the Vocational Agricultural departments in high schools throughout the Commonwealth. Fifteen hundred Future Farmers completed records as to the incidence of accidents on over two thousand Pennsylvania farms. Through their work and the cooperation of their Vocational Agriculture teachers, this study has been conducted with efficiency and economy. This bulletin should contribute valuable resource material for the enrichment of safety education programs in the State's schools.

The material for the bulletin was prepared by William G. Mather, head of the Department of Sociology, and Prodipto Roy, graduate assistant in Rural Sociology, The Pennsylvania State University, in cooperation with Carson F. Mertz, consultant in the Farm and Home Safety Program, Division of Agricultural Education, Department of Public Instruction.

It has been edited by the Department's Publications Office, Rachel S. Turner, Editor.

*Charles H. Boehm*

*Superintendent of Public Instruction*

January 1957



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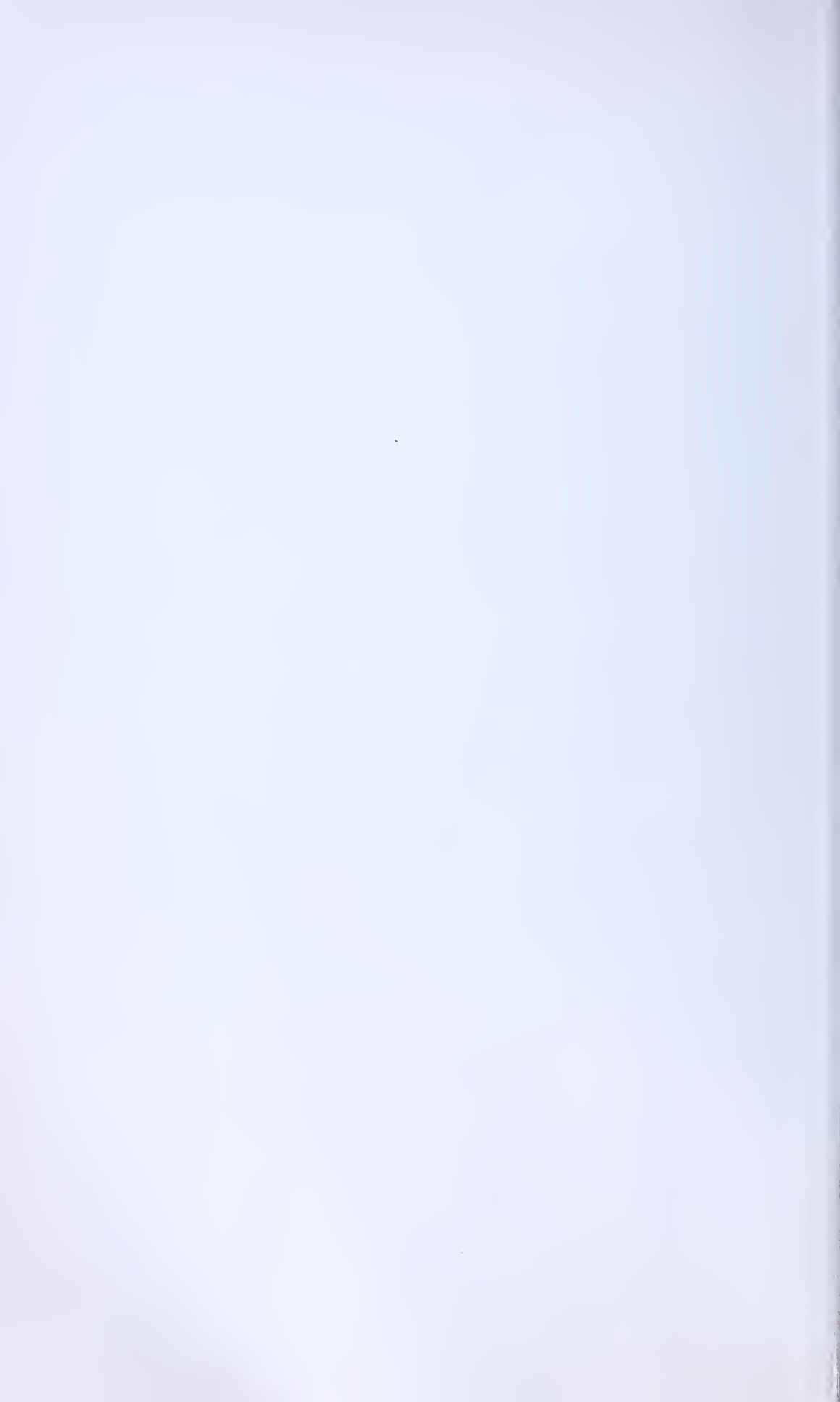
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# I

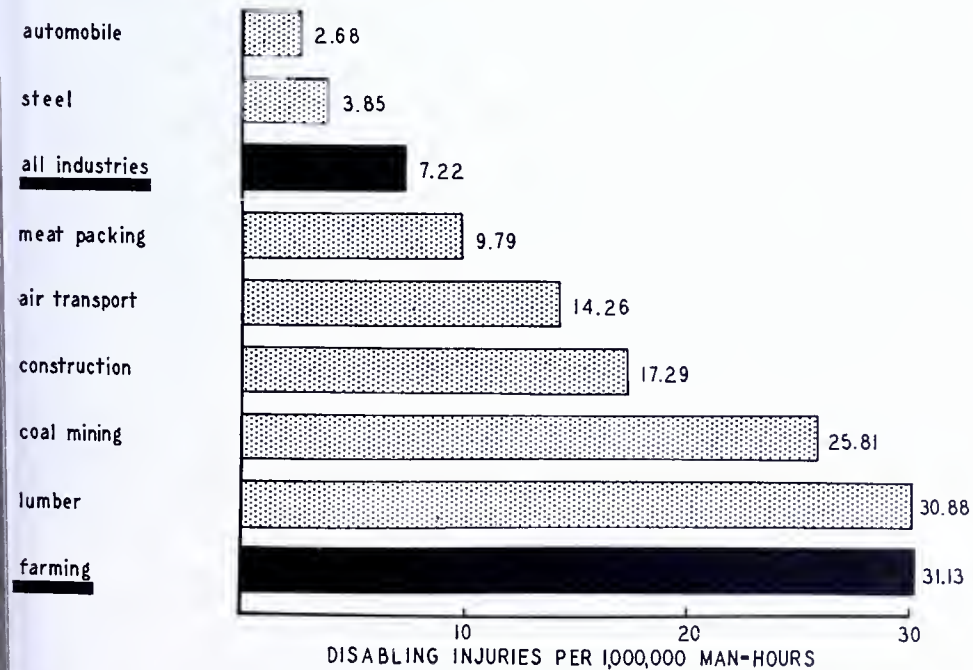
## INTRODUCTION

FARMING is a highly dangerous occupation. According to 1954 statistics from the National Safety Council, agriculture workers had an accidental death rate of 60 per 100,000 workers compared to 25 per 100,000 for all industrial workers. There were 4,930 additional workers out of every 100,000 injured nonfatally in agricultural occupations compared to 3,240 per 100,000 in industry.

According to this study conducted on Pennsylvania farms it was estimated that farming had a higher accident injury rate per 1,000,000 man-hours of work than any of the industrial occupations listed by the National Safety Council.<sup>1</sup> Figure 1 shows that farming has a higher accident rate than lumbering, coal-mining, or construction, and about four times as high a rate as all industries combined.

<sup>1</sup> The farm accident rate was estimated by dividing the total number of Pennsylvania farm work accidents by the average number of man-hours required to manage the crops and livestock on the 2,288 farms in the sample. The industrial accident figures are taken from *Accident Facts 1955 Edition*, p. 26, published by the National Safety Council.

FIGURE 1.-INJURY RATE PER 1,000,000 MAN-HOURS INDUSTRIAL OCCUPATIONS COMPARED WITH FARMING, 1954-1955.



In comparison to the industrial worker the farmer is probably equipped with fewer specialized tools, is not as well trained in their use, works longer at more irregular hours in a greater variety of activities and in more diverse year-round hazards. In addition, the shop foreman checks and enforces safety measures on the industrial worker; there is no one to enforce safety measures on the farmer except himself.

A detailed study was conducted in 1954-55 by the Department of Agricultural Economics and Rural Sociology of the Pennsylvania State University, with the cooperation of the Vocational Agricultural Education departments in high schools all over the State to answer some of these questions:

1. What causes accidents to farm residents?
2. How many accidents occur on farms?
3. When, where, and how do farm accidents take place?
4. What kind of farm person has accidents?
5. How can accidents be avoided?

Fifteen hundred Future Farmers in 116 high schools in 48 counties of the State sent in completed records on 2,288 farms. They visited each of the farms four times during the year, to compile records at three-month intervals. These boys are to be highly commended for their voluntary spirit of cooperation. Without them and without the interest and cooperation of their vocational agriculture teachers the study would not have been conducted so efficiently and economically.

## II

### HOW MANY FARM ACCIDENTS OCCUR?

#### 1. Fatal Accidents

There were 30 accidental deaths reported on the 2,288 Pennsylvania farms *during the five years before* the study. Six fatal accidents were reported during the survey year. This gives an average of six accidental deaths per year over the last six years on the 2,288 farms. At this rate the whole of Pennsylvania, with about 130,000 farms, might have approximately 340 accidental farm deaths per year. The Statistical Methods Division of the State Department of Health records much lower figures, as shown in Table I below:

TABLE I. MAJOR CAUSES OF FARM ACCIDENT DEATHS IN PENNSYLVANIA, 1951-1955\*

<i>Cause of death</i>	<i>1951</i>	<i>1952</i>	<i>1953</i>	<i>1954</i>	<i>1955</i>	<i>Total</i>
Tractor .....	33	23	45	41	38	180
Falls .....	8	19	17	14	16	74
Highway .....	2	15	34	.	..	51
Fires .....	1	29	24	10	3	67
Animal .....	4	4	6	5	4	23
Drowning .....	3	10	14	7	4	38
Other .....	9	19	15	36	29	108
TOTAL .....	60	119	155	113	94	541

\* Summarized from figures obtained from the Pennsylvania Department of Health, Statistical Methods Division.

The reason for the difference in number of fatal accidents to farm people reported by the FFA and State Department of Health is that accidents in the home and accidents on the highway are not at present classified as "farm" by the standard statistical methods code, but they are included in the farm deaths reported by the Future Farmer interviewers.

Tractors are involved in over one-third of the accidental farm deaths in Pennsylvania, with falls and fires taking the next highest tolls. Farm machinery (particularly tractors) is reported to be the leading cause of farm deaths in studies conducted in Kansas, Minnesota, and Wisconsin. In an analysis of over 12,000 fatal farm accidents by the United States Department of Agriculture, farm machinery was involved in over one-half of the accident fatalities and livestock in about one-fifth.

The USDA study also reports that during the 1940-45 period Pennsylvania had 591 fatal accidents. Table I, page 3, shows that during the 1951-55 five-year period there were 541 deaths by accident. Apparently there was a decrease of 50 accidents or a little under 10 per cent between these two periods. But during the 1940-50 decade the farm population declined 21.9 per cent. Therefore the accidental death rate actually had gone up. Comparing these two five-year periods during the last 15 years, although the number of accidental deaths on Pennsylvania farms declined, the accident *death rates* increased.

## **2. Nonfatal Accidents**

An *accident* for the purpose of this study is defined as any injury sustained by a person that required medical attention and caused a loss of one hour or more of time. *Medical attention* is defined as (1) consulting a doctor; (2) any home treatment, such as iodine or adhesive tape, given to an injury immediately or after a period of time. *Loss of time* refers not only to stopping work immediately, but also to time losses later on; for example, a farmer cut by a power saw might not dress the wound immediately but might go to a doctor two days later as a result of the accident.

On the 2,288 Pennsylvania farms in this survey, 354 such accidents were reported on 290 farms with a total of 305 people being injured during the survey year.

Far less information is available on nonfatal accidents than on fatal accidents. The figures quoted in different studies often seem to be in disagreement as shown in Table II.

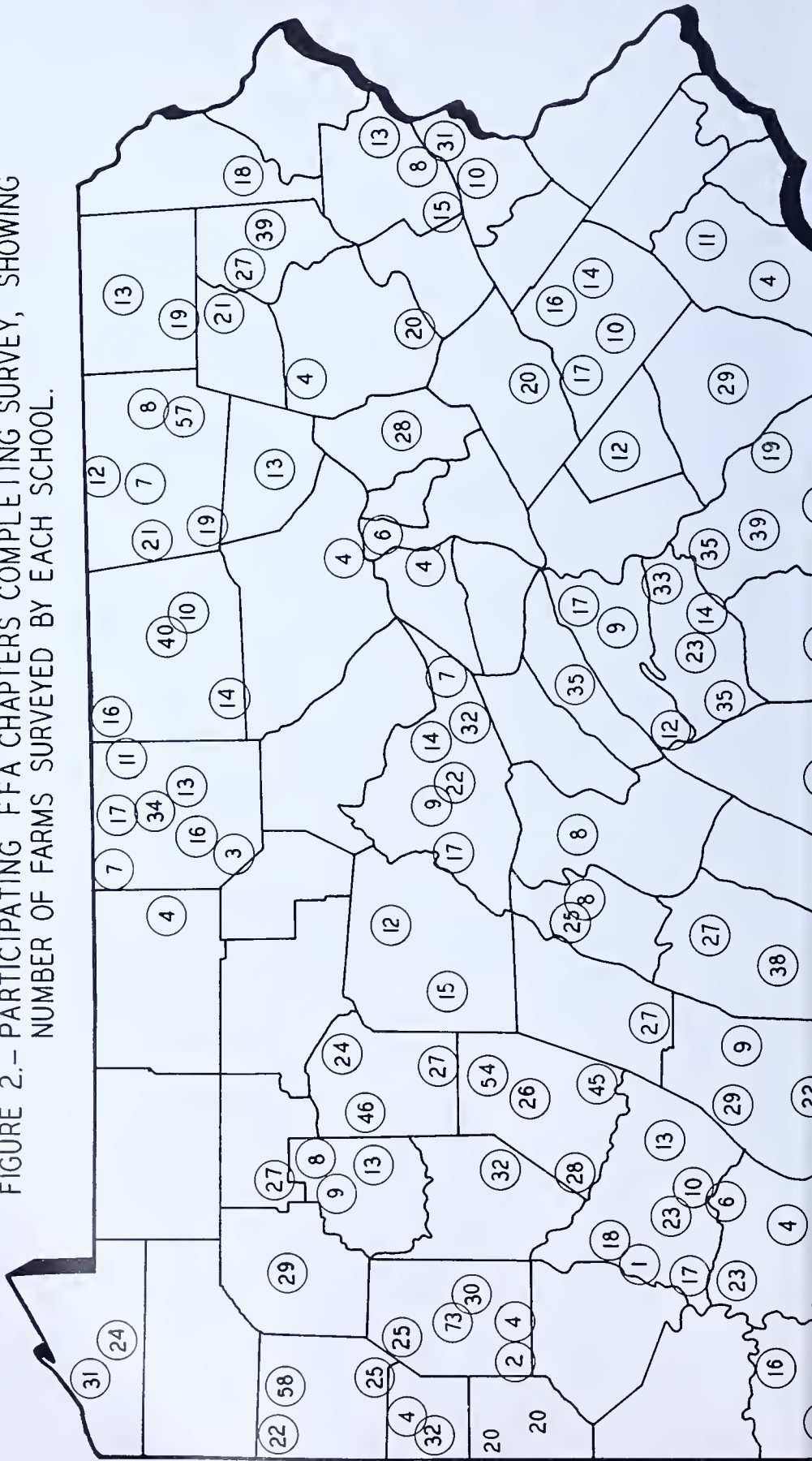
TABLE II.    NONFATAL FARM ACCIDENT RATES REPORTED IN DIFFERENT STUDIES

Source of Information	Accidents per 1000 Farm People
USDA (Rush study) . . . . .	31.3
Canada (Dominion Bureau of Statistics) .	10.9
California (Div. of Labor Statistics) . . .	53    (per 1000 workers)
New York (Swift study) . . . . .	82.2 (Estimated)
Indiana (Willsey and Losey) . . . . .	58.4
Delaware (Whitcomb) . . . . .	24.8
PENNSYLVANIA (Present study) . . . . {	32.9 (Using 1-hour)
	30.2 (Using 1-day)

One of the problems of research in nonfatal accidents has been to define specifically what an accident is. Of the studies cited in Table II, above, accidents are defined as follows: The Indiana study stipulates a bodily injury and an indefinite time loss; the USDA and Canadian studies specify bodily injury and a one-day time loss; the New York study specifies medical care but no definite time loss; other studies do not define the term. One can easily see that in any given state there would be more of the Indiana-type accident than the Canadian-type accident. Therefore the real differences that exist between one state and another are partly clouded by the hazy definition of the term *accidents*.

Future research workers should make an attempt to use a uniform definition of *accident* so that different studies can be better compared.

FIGURE 2.— PARTICIPATING FFA CHAPTERS COMPLETING SURVEY, SHOWING NUMBER OF FARMS SURVEYED BY EACH SCHOOL.

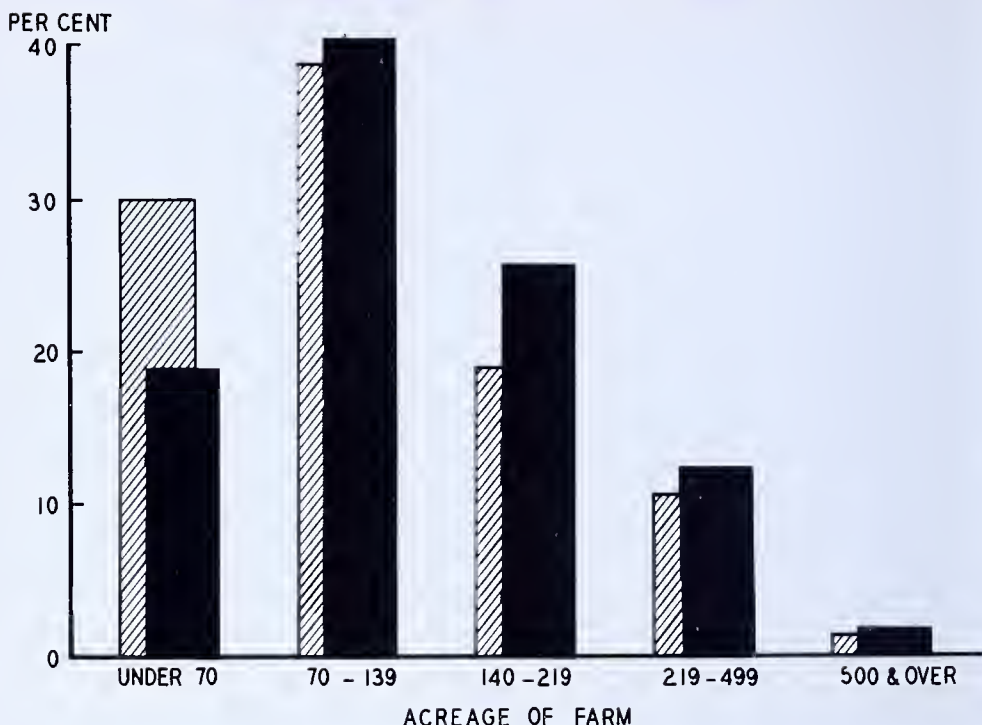


## **1. How Was the Information Collected?**

The information for this study was collected by 1,500 members of the junior and sophomore classes of 116 chapters of the Future Farmers of America (FFA). The boys were helped by their vocational agriculture teachers to collect information on prescribed forms from their two neighboring farm families. The boys conducted four quarterly interviews covering the period October 1, 1954 to September 30, 1955.

In the first quarter detailed information about the farm such as, age and sex of all residents, the acreage of farm, the size of operation, the type of farm, the number of trucks and tractors, fuel oil, and electricity consumption, was collected in addition to information about accidents. During the second, third, and fourth quarters only information about accidents occurring during the preceding three months was collected. In this way complete records on 2,288 farms, widely scattered in 48 counties all over the State were obtained. The distribution of Future Farmers of America chapters cooperating and the number of farms reported on by each chapter is shown in the map. See Figure 2 opposite. The results presented on page 8 are a preliminary report taken primarily from information gathered on these 2,288 farms.

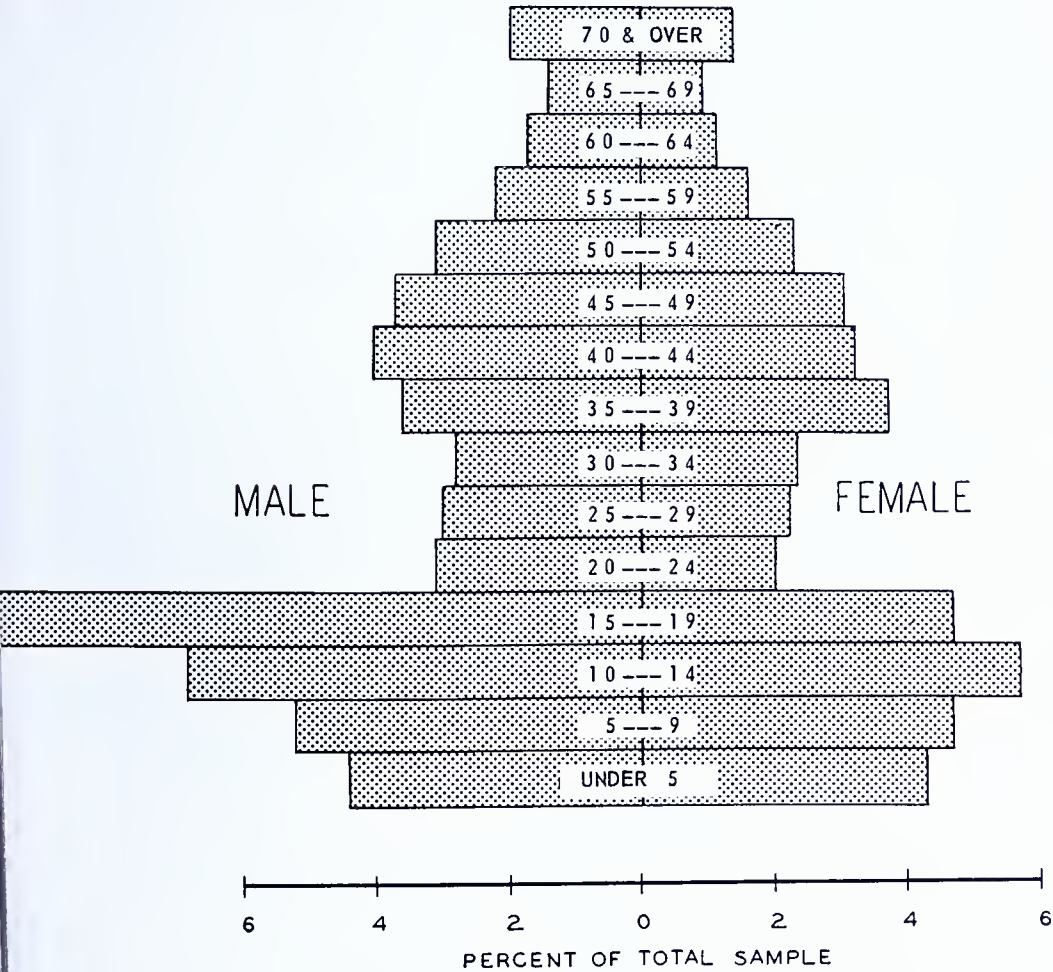
FIGURE 3 - COMPARISON OF SIZE OF COMMERCIAL FARMS IN U.S. CENSUS OF AGRICULTURE, PENNSYLVANIA, 1950 WITH SAMPLE.



## 2. How Good Was the Choice of Farms?

This survey was designed primarily to study accidents to people engaged in the agricultural industry. In order to eliminate those farmers who were engaged largely in other jobs, the survey concentrated on what the Census of Agriculture refers to as "Commercial Farms." Figure 3, above, shows graphically how proportions of the different size categories in the sample (the darker bars) compare to the Census of 1950 with respect to acreage. The sample has fewer farms below 70 acres and more farms in all categories above 70 acres. Since the sample was taken late in 1954, it reflects a known trend that commercial farms have become larger since 1950. The 2,288 farms may be considered a fairly good representation of commercial agriculture in Pennsylvania.

FIGURE 4.- AGE AND SEX DISTRIBUTION OF PEOPLE ON 2288 FARMS.



3. Age and Sex Distribution of All People on 2,288 Farms in Sample

The age and sex pyramid of the sample population is shown in Figure 4 above. In order to know what age and sex groups have the highest accident rates one must first determine how many people of each age and sex group are on the 2,288 farms. The diagram shows a disproportionately large number of boys from 15-19 years and a small number of girls of the same age. It is a characteristic that the girls of the farm families start migrating to town about that age. There are relatively small proportions of both sexes of the 20-35 age groups; migration and military draft account for most of the men leaving the farm and continued migration accounts for the women.

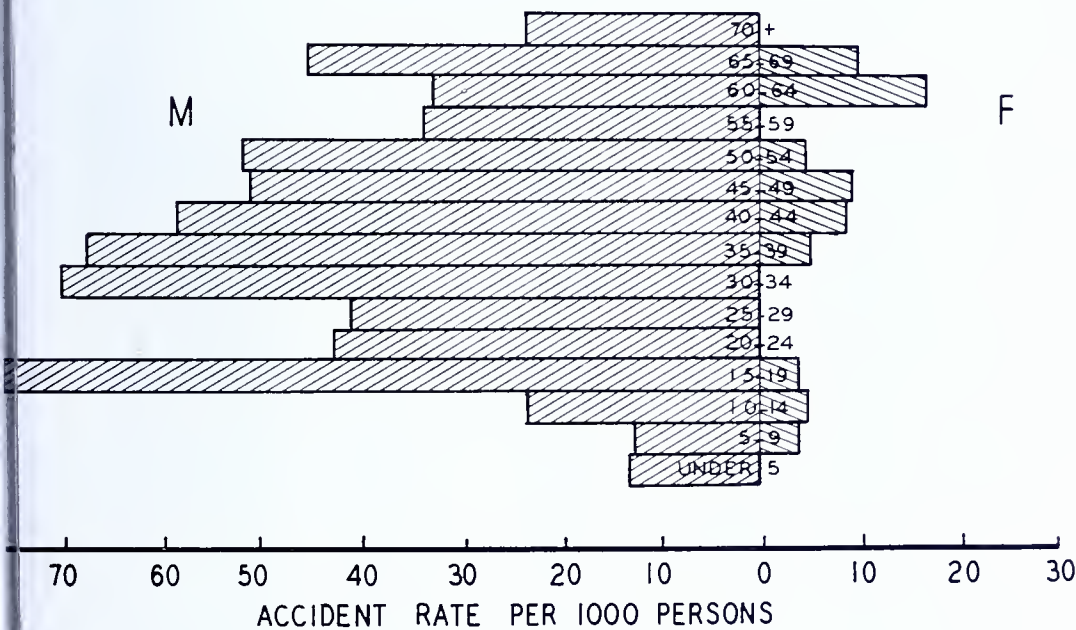
TABLE III. AGE AND SEX DISTRIBUTION OF ALL PEOPLE ON THE 2,228 FARMS, OF VICTIMS OF ACCIDENTS, AND RESULTANT ACCIDENT RATE PER 1,000

Age Group	MALES						FEMALES					
	Sample			Victims			Sample			Victims		
	Number	Per Cent	Number	Per Cent	Accidents per 1,000 people		Number	Per Cent	Number	Per Cent	Accidents per 1,000 people	
Under 5	475	4.4	6	2.0	12.6		463	4.3	0	0.0	0.0	
5-9	562	5.2	7	2.3	12.5		505	4.7	2	.7	4.0	
10-14	733	6.8	17	5.7	23.2		615	5.7	3	1.0	4.9	
15-19	1,147	10.6	89	29.7	77.6		478	4.4	2	.7	4.2	
20-24	329	3.0	14	4.7	42.6		211	2.0	0	0.0	0.0	
25-29	318	2.9	13	4.3	40.9		240	2.2	0	0.0	0.0	
30-34	301	2.8	21	7.0	69.8		249	2.3	0	0.0	0.0	
35-39	385	3.6	26	8.7	67.5		400	3.7	2	.7	5.0	
40-44	429	4.0	25	8.3	58.3		348	3.2	3	1.0	8.6	
45-49	392	3.6	20	6.7	51.0		319	3.0	3	1.0	9.4	
50-54	330	3.1	17	5.7	51.5		251	2.3	1	0.3	4.0	
55-59	238	2.2	8	2.7	33.6		169	1.6	0	0.0	0.0	
60-64	183	1.7	6	2.0	32.8		120	1.1	2	.7	11.7	
65-69	155	1.4	7	2.3	45.2		100	0.9	1	.3	10.0	
70 and over	209	1.9	5	1.7	23.9		155	1.4	0	0.0	0.0	
TOTAL OR AVERAGE	6,186	57.2	281	93.8	45.4		4,623	42.8	19	6.4	4.2	

4. The Accident Rate

There were in total 354 accidents reported; these are divided according to age and sex. The accident rate for each age and sex group was computed by dividing the number of accident victims in each category by the total number of people in that category and multiplying by 1,000. These accident rates are presented numerically in columns 6 and 11 of Table III, page 10, and they are graphically shown in Figure 5, below.

FIGURE 5.— ACCIDENT RATE PER 1000 BY AGE AND SEX AMONG FARM RESIDENTS IN PENNSYLVANIA.



(a) *Are girls more careful than boys?* This study shows a very sharp distinction between males and females. In total the males had 14 times as many accidents as females. As can be seen from Figure 5, women of all age groups had lower accident rates than men. Table III, page 10, shows that on these Pennsylvania farms the accident rate was 45.4 per 1,000 males compared to 4.2 per 1,000 females. A preliminary report on an Iowa study shows that men had 1,380 accidents compared to 615 for women. The USDA study reports men as having three times as many accidents as women. The New York study indicated that men incurred 92 per cent of the total number of accidents. California reports that men had 95 per cent of the disabling accidents in farm work. These reports all agree on one point—that farm men have a much greater number of accidents than farm women.

(b) *What age group has the most accidents?*<sup>9</sup> Figure 5, page 11, shows that in Pennsylvania boys from 15-19 years had the highest accident rate—almost 80 per 1,000 boys. The 30-39 year-old men were the next highest group. This is not the first study to show that teen-age boys are most likely to have accidents. The Canadian study found that the 14-19 age group reported the highest accident rate followed by the 25-44 age group. In the Iowa farm accident study the 10-19 age groups had a higher number of accidents than any other ten-year age group. In a study reporting all types of accidents to school pupils in Kansas, accidents were found responsible for 53 per cent of all deaths in the 15-19 age group. It seems imperative from such evidence that boys and girls start learning as early as possible that their safety is in their own hands. If safety is not learned in school it may never be learned; this would produce men and women who are perpetual menaces to themselves and to society.

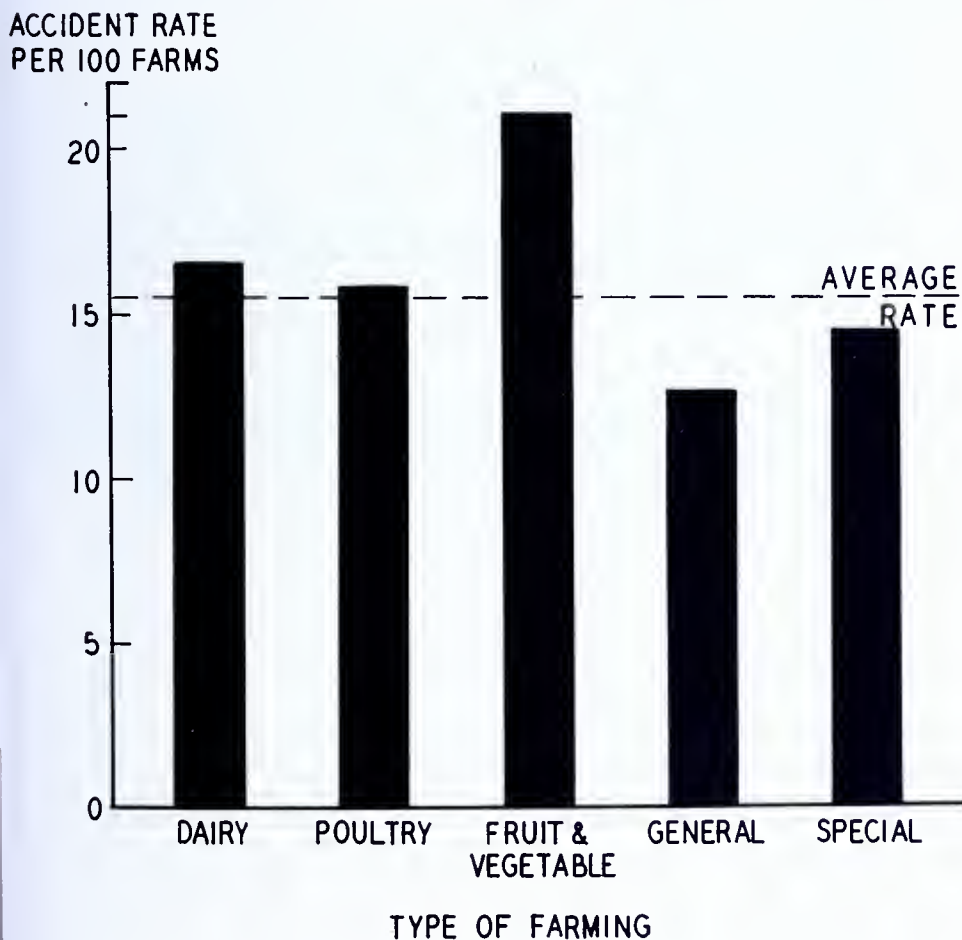
#### QUESTIONS FOR DISCUSSION:

1. Why do farm men and boys have so many more accidents than farm women and girls?
2. Why do the 15-19-year-old boys have the highest accident rate among men and boys?
3. The U. S. Vital Statistics Bureau reports the 15-24 age group as having the highest number of highway accidents. What relation is there between highway accidents and farm accidents that makes these age-groups more prone to accidents?
4. Why do older women have a higher accident rate than younger women and girls?

## IV

### WHAT KIND OF FARM HAD THE MOST ACCIDENTS?

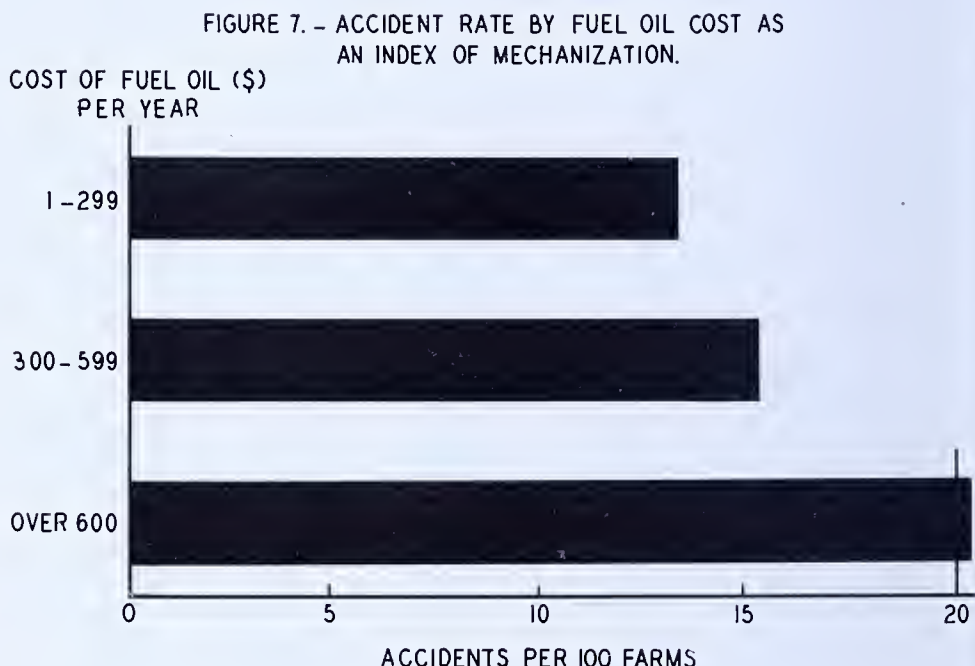
FIGURE 6.- ACCIDENT RATE BY TYPE OF FARMING



#### 1. Type of Farm

It has been shown in at least two studies that accident rates vary from one region to another, as one moves from one type of farming to another. The Canadian study indicated that the Prairie states had higher accident rates than Quebec or the Maritime states. The USDA study showed that the South had an accident rate of 26.6 per 1,000 people compared to 40.0 in the West. Pennsylvania has different types of farming but they are well distributed over the Commonwealth. It was found that all Pennsylvania areas had very similar accident rates.

When classified according to the type of farming, the fruit and vegetable farms reported the highest accident rate—21 accidents per 100 farms—followed by dairy and then poultry farms (Figure 6, page 13). The farms in which no particular enterprise dominated showed the lowest accident rate.



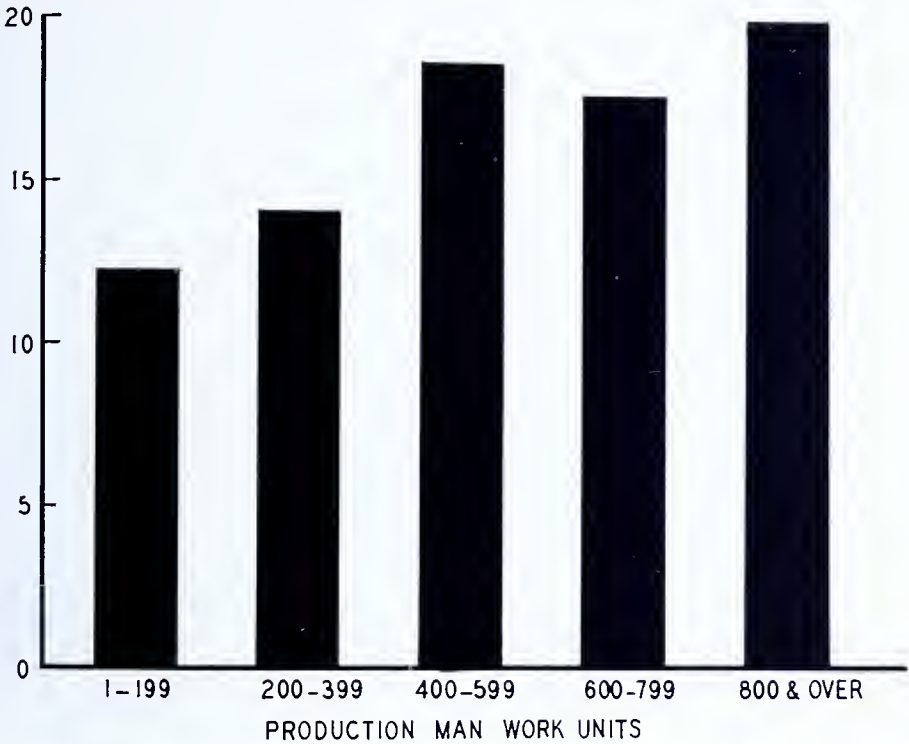
## 2. Mechanization

One of the earliest studies of farm accidents conducted in Minnesota suggested that the rapid development of mechanization in this country had resulted in an increase in the incidence of accidents. As newer and more powerful machinery was being developed for almost every farm operation the farmer had to learn to operate these machines and adjust himself to them. It seems that machines can be developed faster than men can learn how to operate them.

This Pennsylvania study indicates (Figure 7 above) that farms that are more mechanized have more accidents than those that are less mechanized. Several measures for mechanization were used in this study: cost of fuel oils, cost of electricity, number of tractors, number of motor trucks, etc. The cost of fuel oils seemed to be the best indicator and was selected to show the relationship between mechanization and accident rate. Farms using more gas-consuming machines have the higher accident rates.

FIGURE 8. - ACCIDENT RATE BY SIZE OF OPERATION.

ACCIDENT RATE  
PER 100 FARMS

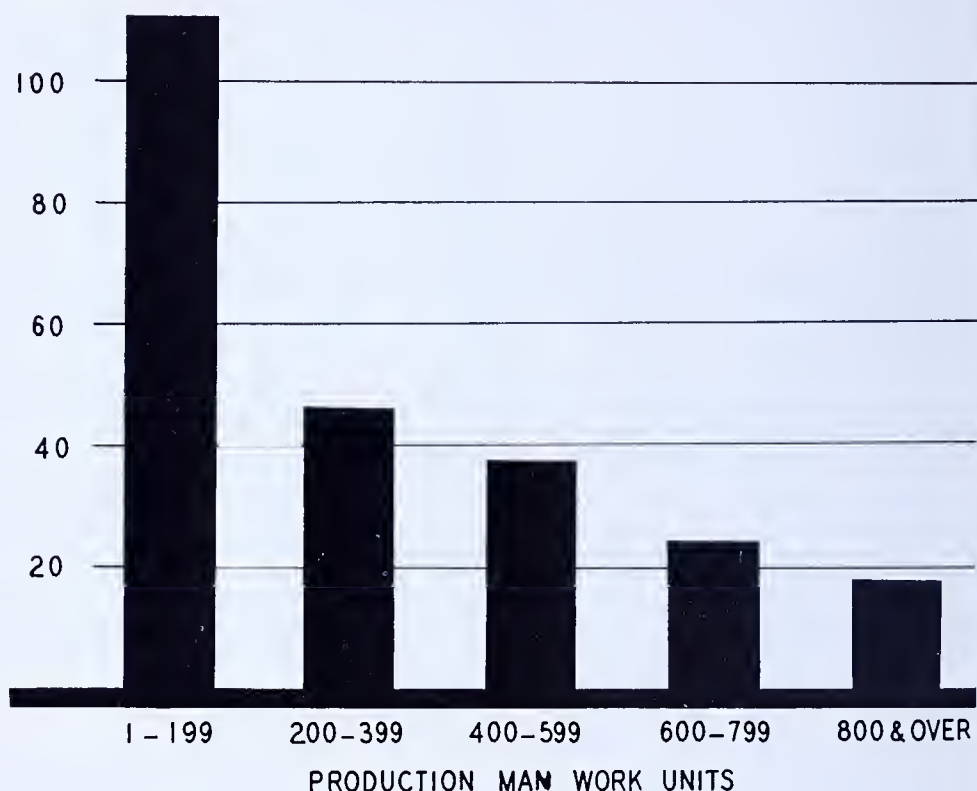


### 3. Size of Operation

Figure 8 shows the relation of the size of farm operation to the accident rate. The chart illustrates that as the farm operation gets larger the accident rate also rises. Size of operation in this study was measured in *Production Man Work Units*—i. e., the number of 10-hour days that would be needed to perform all the operations on a given farm. It is a measure which can compare, for example, the size of operation on a 10,000-bird poultry farm and on a 50-cow dairy farm. The accident rates shown here may be interpreted as follows: (1) the first bar means that for every 100 farms with an average of 100 Production Man Work Units per year there were 12 accidents; (2) the third bar means that for every 100 farms that averaged 500 Production Man Work Units there were 18.5 accidents. It was reasonable to assume that farms which required more man-hours in the farm operations were likely to have more accidents.

FIGURE 9.- ACCIDENT RATE PER 1,000,000 MAN-HOURS BY  
SIZE OF OPERATION.

ACCIDENT RATE PER  
1,000,000 MAN-HOURS



The rate of accidents for every 1,000,000 hours of work for each of the five farm-size categories was computed and it was found that the smallest farms had the highest accident rates per million man-hours of labor as shown in Table IV, page 17. As the farms grew larger the accident rate per 1,000,000 man-hours of work declined from 110.1 for the 1-199 PMWU-farms down to 18.8 for the 800-1,999 PMWU-farms.

TABLE IV. ACCIDENT RATE BY SIZE OF OPERATION, PER 100 FARMS AND PER 1,000,000 MAN-HOURS

<i>Size of farm (PMWU)</i>	<i>Number of farms</i>	<i>Number of accidents</i>	<i>Accident rate per 100 farms</i>	<i>Accident rate per 1000,000 man-hours</i>
1-199 .....	533	65	12.2	110.1
200-399 .....	741	104	14.0	46.4
400-599 .....	604	112	18.5	38.0
600-799 .....	250	44	17.6	25.1
800-1,999 .....	118	24	20.4	18.8
TOTALS .....	2,246	349	15.54	39.65

#### QUESTIONS FOR DISCUSSION:

1. What activities are dangerous on fruit and vegetable farms?
2. What kinds of accidents take place on dairy farms?
3. If accidents increase with mechanization, is the machine at fault or the farmer?
4. How can farms be highly mechanized and yet have low accident rates?
5. Explain why small farms have fewer accidents per 100 farms, but more accidents per million man-hours.

# V

## WHEN, WHERE, AND HOW DO ACCIDENTS OCCUR?

### 1. Time

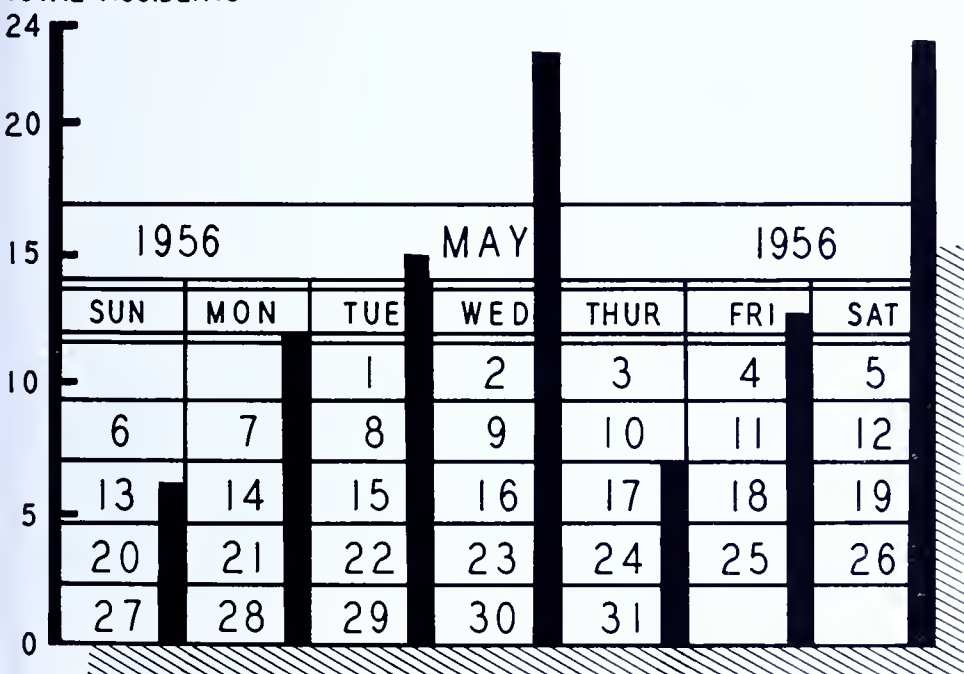
a. *Month.* Traditionally it has been found that most farm accidents took place during the summer months. In this study of Pennsylvania the accidents were fairly evenly distributed through the 12 months with actually more accidents in the winter months (see Table V, below). The winter accidents were mostly accidents associated with the dairy industry and traffic on ice or snow. It seems reasonable that in the grain-growing prairies there would be a higher incidence of accidents in the summer; but in round-the-year work like dairy farming the icy winter may well be the most hazardous season.

TABLE V. ACCIDENTS REPORTED BY CALENDAR MONTH, OCTOBER 1, 1954—  
SEPTEMBER 30, 1955

<i>Month</i>	<i>Number</i>	<i>Percentage</i>
January .....	31	10.2
February .....	18	6.0
March .....	21	6.9
April .....	25	8.2
May .....	18	5.9
June .....	26	8.5
July .....	26	8.5
August .....	30	9.8
September .....	21	6.9
October .....	30	9.8
November .....	33	10.8
December .....	26	8.5
	<hr/>	<hr/>
	305	100.0
No information .....	29	

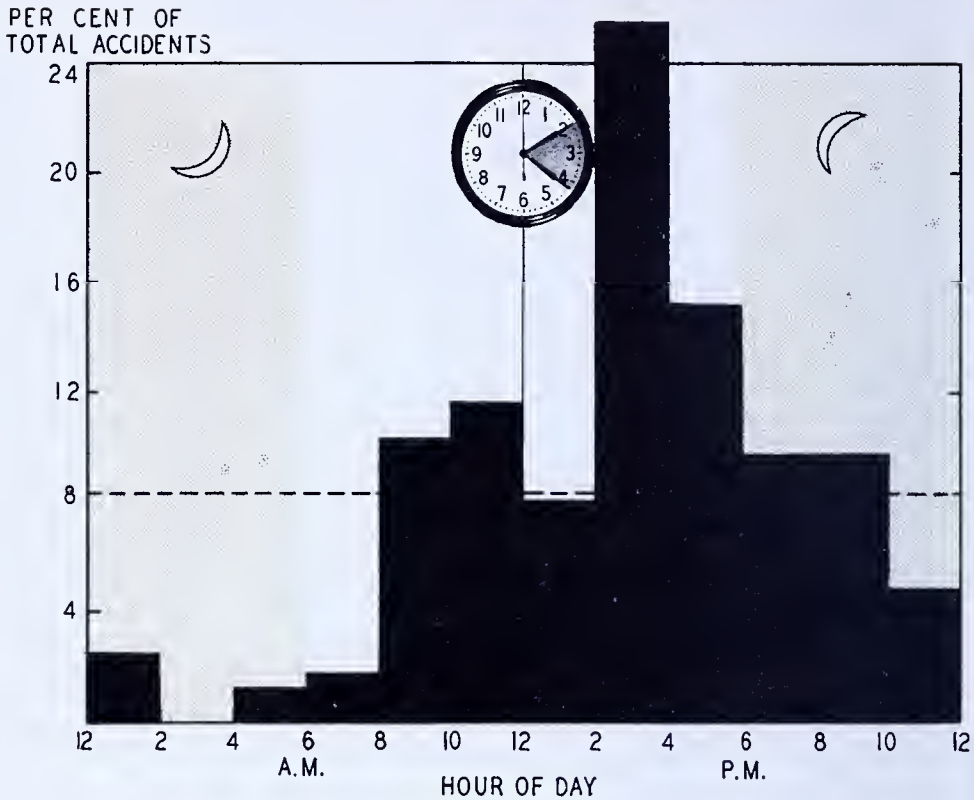
FIGURE 10.- ACCIDENTS BY DAY OF WEEK.

PER CENT OF  
TOTAL ACCIDENTS



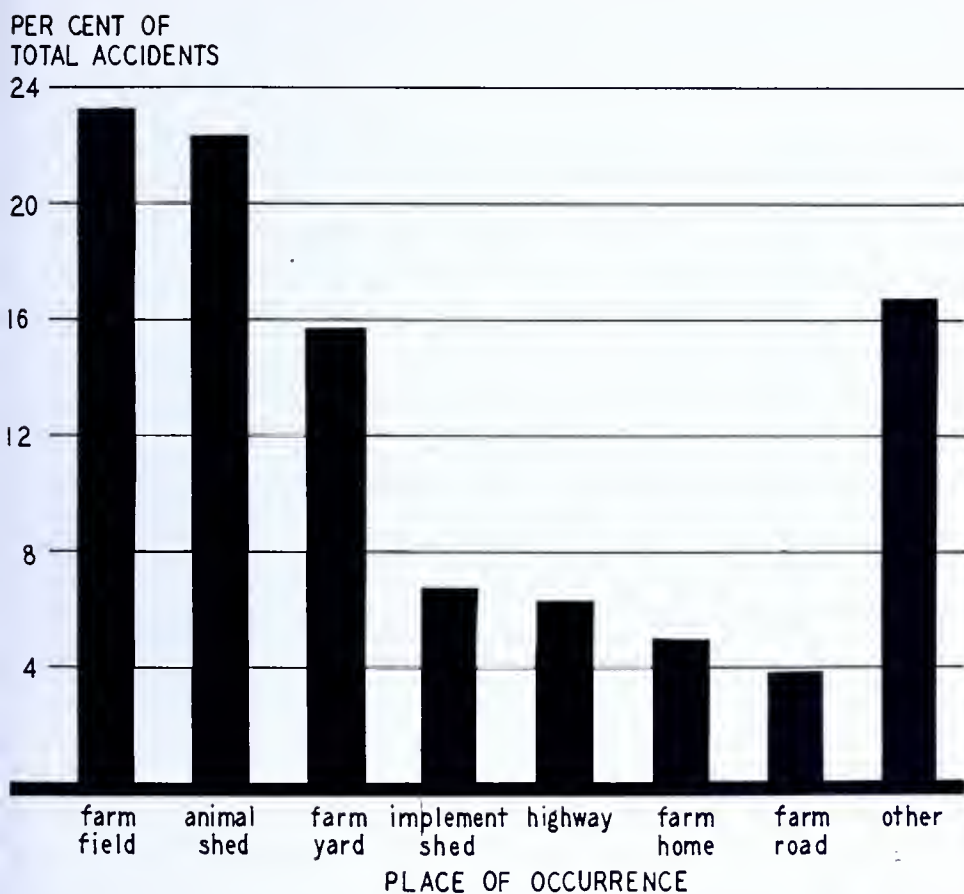
b. *Day of week.* Wednesday and Saturday were found to be the most hazardous days of the week. The Iowa study found Saturday to be the most hazardous day followed by Monday, then Wednesday. Figure 10, above, shows the per cent of total accidents that occurred on each day of the week. All days except Tuesday, Wednesday, and Saturday have fewer accidents than the average that would be expected; in Pennsylvania over 46.9 per cent of the accidents occurred either on Wednesday or Saturday.

FIGURE 11.- ACCIDENTS BY HOUR OF DAY.



c. *Hour of day.* As would be expected most of the accidents occurred during the working period of the day—8 a. m. to 6 p. m. Figure 11, above, presents the distribution of accidents in each two-hour period of the day. The work period from 2 to 6 in the afternoon had almost twice as many accidents as the 8 to 12 period in the morning. The period from 2 to 4 p. m. on Pennsylvania farms accounted for 25 per cent of the total number of accidents. The Iowa study found that 20 per cent of the total number of accidents that were reported occurred between 2 and 4 p. m.

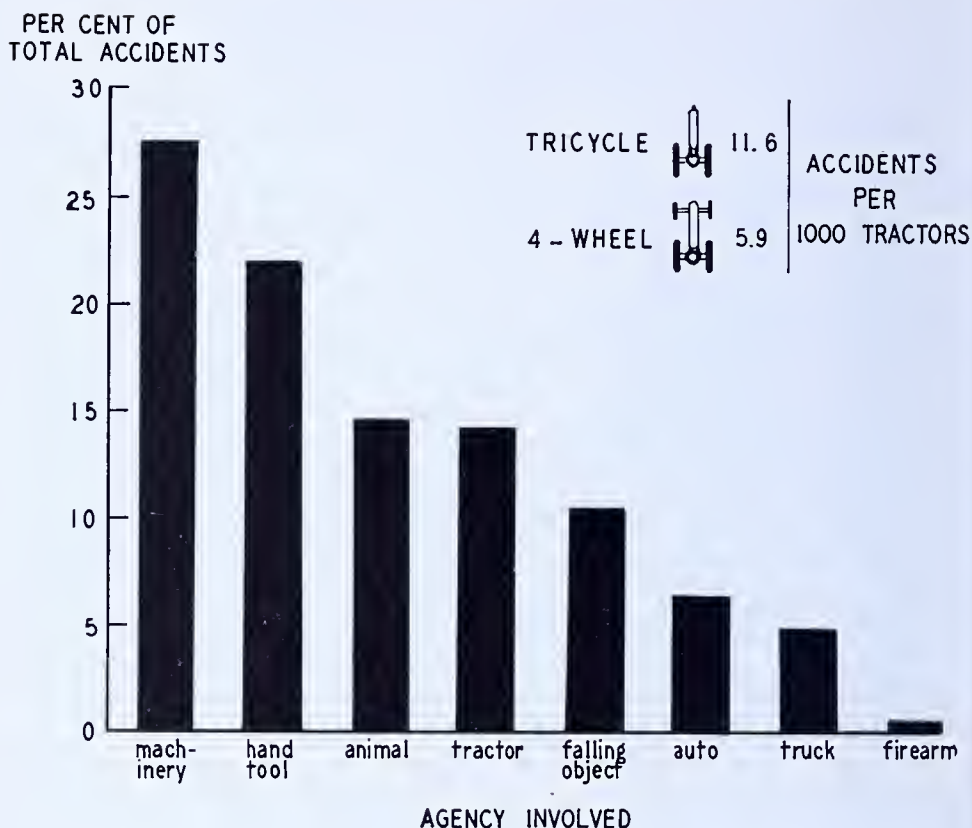
FIGURE 12.- ACCIDENTS BY PLACE OF OCCURRENCE.



## 2. Place

Accidents occurred most frequently in the farm field, followed closely by animal barns, the farmyard, and the implement shed, respectively. Figure 12 shows the seven places that accidents occurred most frequently; a large number of other accident areas have been lumped together as "other." In this study only 6 per cent of the accidents occurred on the highway and 5 per cent in the farm home. Other studies have shown much higher proportions in these two categories. The USDA study had 28 per cent of its accidents occurring in the farm home, and the Delaware study had about 30 per cent. The USDA study reported 11 per cent as "traffic" accidents and the Iowa study reported 11 per cent as "motor vehicle" accidents. There may have been some farm home and highway accidents that were not reported in this study.

FIGURE 13.- ACCIDENTS CLASSIFIED BY AGENCY INVOLVED.

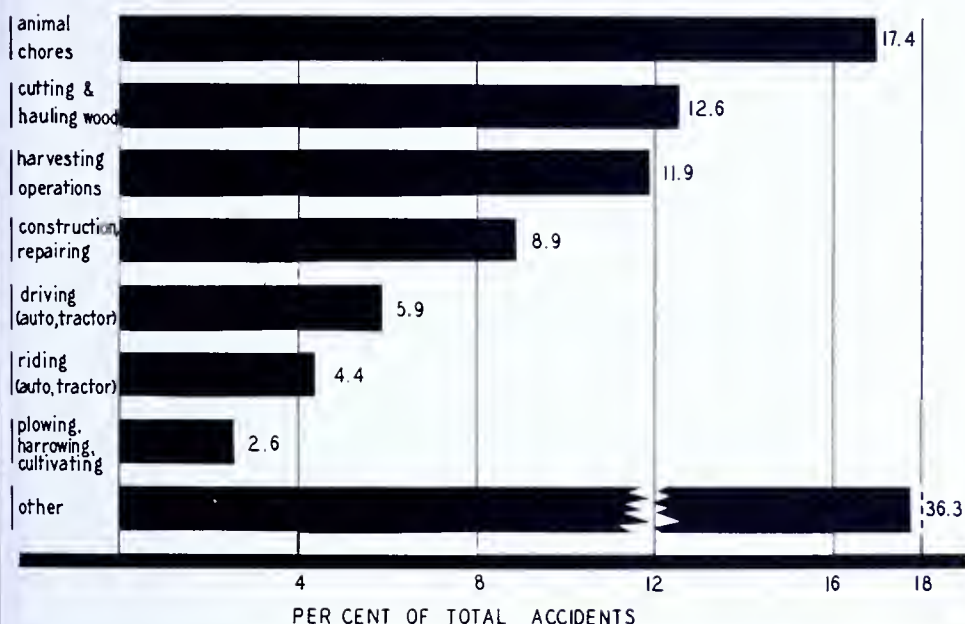


### 3. Agency

Machinery has in the recent past been regarded as the most important agency responsible for farm accidents. In Figure 13 the major agencies involved in the Pennsylvania farm accidents are depicted; tractors are shown separately from the other machinery. Tractors together with other machinery were involved in over 40 per cent of the accidents; tractors themselves were involved in 14 per cent of all accidents. In the Iowa study, machinery featured in about 18 per cent of the accidents and tractors were involved in about 4 per cent of all accidents. Tractors are involved in a much higher proportion of the fatal accidents, or in accidents involving serious injuries. See Table I, page 3.

It has often been suggested that tricycle tractors require more care in operation than the 4-wheel type. This study found that for every 1,000 tricycle tractors in operation there were 12 accidents, as compared to 6 for every 1,000 4-wheel tractors.

FIGURE 14.—ACCIDENTS BY SPECIFIC ACTIVITY.



#### 4. Activity

In this survey of Pennsylvania farms the dairy industry was the predominating agricultural enterprise. Therefore, it was not surprising to find that the activity that farmers were most frequently engaged in at the time of an accident was animal chores. See Table VI. Cutting and hauling wood were next in order followed by construction or repair work. See Figure 14 above. The large list of activities and the fact that about one-third of them could not be classified, indicate the variety of dangerous jobs that a farmer does compared with the single activity in which an industrial worker is usually engaged.

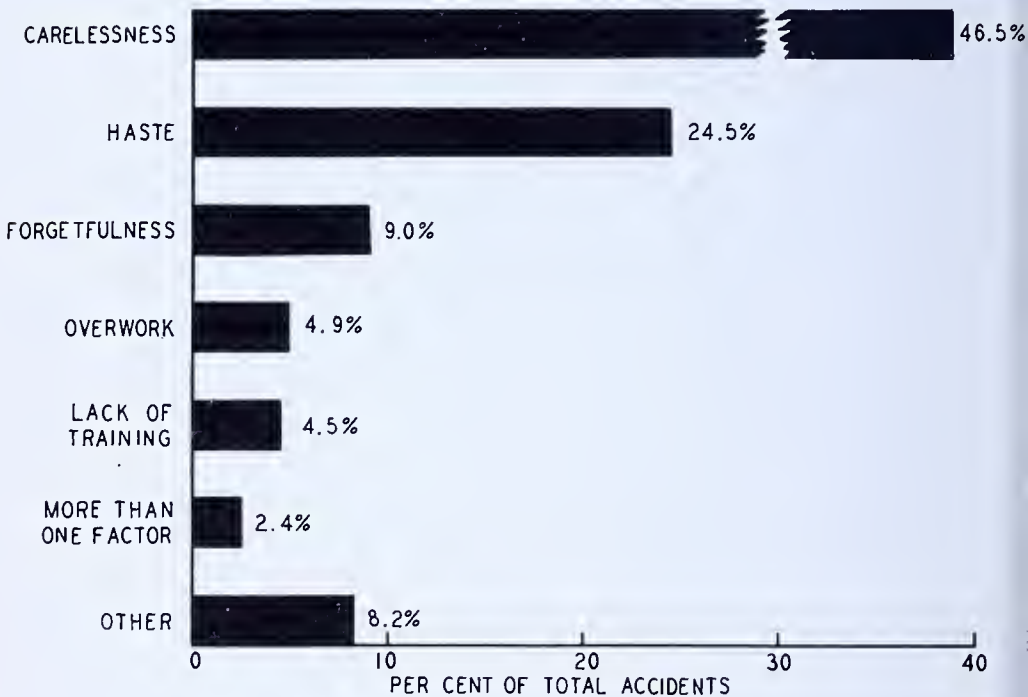
TABLE VI: ACCIDENTS BY SPECIFIC ACTIVITY

	Number	Per-Cent
Animal chores .....	47	17.4
Cutting and hauling wood .....	34	12.6
Harvesting operations .....	32	11.9
Construction-repairing .....	24	8.9
Driving—auto, truck, tractor .....	16	5.9
Riding—auto, truck, tractor .....	12	4.4
Plowing, harrowing, cultivating .....	7	2.6
Others .....	98	36.3
	<hr/> 270	
No information .....	51	
TOTAL .....	321	100.0

## 5. Contributing Factors

In making this study a question was asked so that persons interviewed could check either or both a personal and a nonpersonal factor contributing to the accident. Over 75 per cent of the accidents involved a personal factor and 56 per cent reported involved a nonpersonal factor.

FIGURE 15.-PERSONAL FACTORS REPORTED AS CONTRIBUTING TO ACCIDENTS.



Using the 75 per cent as a unit, Figure 15 shows the per cent of accidents that reported different personal factors as contributing to accidents. The top three categories are personal factors which seem avoidable. It is very interesting that the people injured felt that 80 per cent of the accidents involving personal factors were caused, at least partially, by their own carelessness or haste or forgetfulness. Traditionally people have felt that farm accidents were due to overwork or lack of training. These two factors account for only 9.4 per cent of the personal contributing factors.

The New York study reported that 85.3 per cent of the accidents involved a personal reason and 14.7 per cent a nonpersonal reason as the main cause of the accident. Among the nonpersonal factors, weather was cited in 32 per cent of the accidents and slope of land was cited in 29 per cent. Unguarded machinery and defective tools accounted for the remaining 39 per cent of the nonpersonal factors.

It seems that the majority of the contributing factors reported, both personal and nonpersonal, were avoidable. The study indicates that it is the personal element, not the environment, that is responsible for most of the accidents.

#### QUESTIONS FOR DISCUSSION:

1. How does change of season determine the type of accidents?
2. What does a Pennsylvania farm family do on Wednesday and Saturday to make these days more dangerous for them?
3. Why do farmers have more accidents in the afternoon than in the morning?
4. Why do most of the farm accidents take place between 2 and 4 p. m.? (Is it machinery failure or human failure?)
5. Are some people more in a hurry or more careless or more absent-minded than others? What makes them so?
6. A farmer usually "checks over" a machine before he uses it; what can he do about himself?

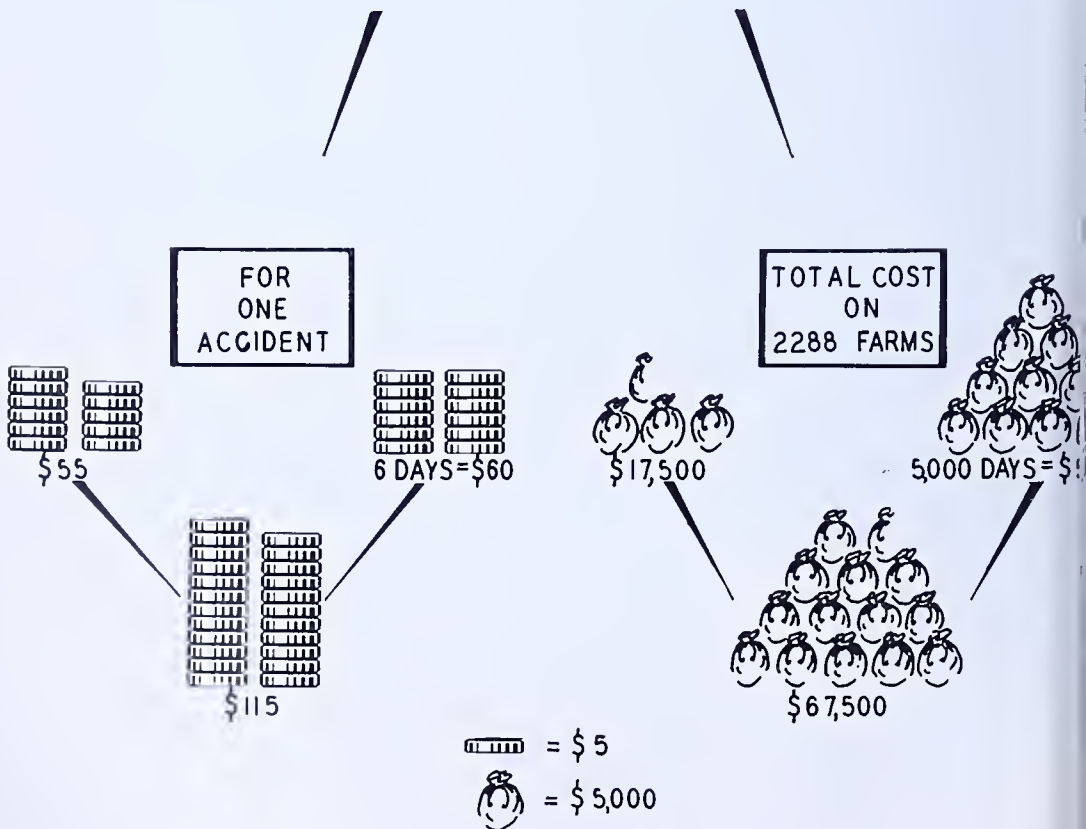
# VI

## HOW MUCH DO ACCIDENTS COST THE FARMER?

Accidents are a great drain upon the human and material resources of the Pennsylvania farmer. The estimate of the cost of an accident in this study is conservative; first, because the emphasis of the study was primarily on injury accidents; and second, because all costs were not reported (repairs to broken tools, for example). The average cash cost of an accident was \$55, mainly in medical bills. The median loss of time for an accident was 6 days. Computing the labor cost for an average farmer's day at a dollar an hour for a 10-hour day, the farmer lost \$60 worth of time per accident. At a conservative estimate, the average Pennsylvania farm accident in this study cost the farmer \$115.

In the Iowa study, if the sum of medical costs and time loss were averaged, the cost would be \$202. Figure 16, below, graphically

FIGURE 16.- COST OF ACCIDENTS.



shows a total loss of \$67,500 on the 2,288 Pennsylvania farms surveyed.

If this cost rate should be extended to ALL Pennsylvania farms, the total loss for the year would be approximately \$4,500,000.

#### QUESTIONS FOR DISCUSSION:

1. What per cent of the farm accident costs are covered by insurance?

2. If a hired man or visitor is injured on a farm, is the farmer liable for the accident costs?

## VII

### SUMMARY AND RECOMMENDATIONS

1. *What causes farm accidents?* The study in general points to two places to look for the causes of farm accidents: (a) The farming environment, i. e., the size and type of farm, the condition of the machines, the buildings, and the homestead; (b) The accident-prone person, i. e., age, sex, accident history, and type of personality.

2. *How many accidents occur on Pennsylvania farms?* (a) During the last 15 years, on the average, a little over 100 farmers have been killed in farm accidents in Pennsylvania each year; (b) For every 1,000 farm people in Pennsylvania there are about 30 nonfatal accidents causing a loss of more than one day of time.

3. *On what kind of farms do accidents happen?* (a) The type of farming that is practiced affects the number of accidents and the type of accidents that are likely to occur. Fruit and vegetable farms have the highest accident rate followed by dairy farms. General farms have the lowest rate of accidents; (b) Farms that use more machinery have higher accident rates; (c) Although the larger farm operations have more accidents, they are safer per hour of work put in.

4. *When, where, and how do accidents happen?* (a) They occur throughout the year, about the same number each month; Wednesday and Saturday are the more hazardous days of the week and 2-4 p. m. the most dangerous period of the day; (b) Most of the accidents occur in the farm fields, farmyard, or in the barn; (c) Farm machinery is involved in 40 per cent of the accidents. Tricycle tractors are about twice as dangerous as the 4-wheel type; (d) Animal chores, cutting wood, and construction and repairs are the activities that farmers are most frequently engaged in at the time of accident.

5. *What kind of person has accidents?* Boys from ages 15-19 have the highest accident rates followed by men from 30 to 39. Males in general have over ten times as many accidents as females. Eighty per cent of the accidents reporting a contributing personal factor listed haste or carelessness or forgetfulness. A great deal more is to be learned about the kind of person that has accidents.

6. *How can accidents be prevented?* (a) There must be a sustained effort to collect more reliable information about the causes of farm accidents. This knowledge should be systematically tabulated and effectively disseminated through the papers, magazines, radio, and television; (b) Many youth organization such as the FFA, the FHA, 4-H clubs, and other farm organizations should encourage farmers to locate and correct as many farm hazards as possible; (c) Accident-causing tendencies should be corrected within oneself; teen-age farm boys, especially, should get together and agree that it's smart to be safe.

## VIII

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